

REMARKS

The present Amendment cancels claims 1-35 and adds new claims 36-42. Therefore, the present application has pending claims 36-42.

Claims 15-17 stand objected to under 37 CFR §1.75(c) as being in improper dependent form. As indicated above claims 15-17 were cancelled. Therefore this objection is rendered moot. Accordingly, reconsideration and withdrawal of this objection is respectfully requested.

Claims 1-9 and 18-35 stand rejected under 35 USC §102(e) as being anticipated by Rantala (U.S. Patent No. 5,560,570); claims 10, 11, 13 and 14 stand rejected under 35 USC §103(a) as being unpatentable over Rantala in view of Tamura (U.S. Patent No. 5,640,556); and claim 12 stands rejected under 35 USC §103(a) as being unpatentable over Rantala in view of Tamura and further in view of Lin (U.S. Patent No. 5,386,578). As indicated above claims 1-35 were cancelled. Therefore these objections are rendered moot. Accordingly, reconsideration and withdrawal of these objections is respectfully requested.

New claims 36-42 were drafted to more clearly describe the features of the present invention not taught or suggested by the references of record, particularly Rantala, Tamura and Lin wheter taken individually or in combination with each other as suggested by the Examiner.

New claims 36-42 are directed to a method for implementing extensible network-attached storage in a system including a plurality of computers, at least one secondary storage apparatus having a storage medium that can save data after

shutting down a power source and an active network storage controller, and a network or input/output (I/O) cable for connecting the computers with the secondary storage apparatus. The secondary storage apparatus according to the present invention includes a plurality of storage units and the active network storage controller is equipped with a block access module which provides the computers with a block-based I/O function for reading data from one of the storage units or writing data to one of the storage units. As per the present invention at least one application program is deployed in a first computer and the application program issues object-based I/O requests to the secondary storage apparatus, each request requesting input or output to or from the secondary storage apparatus of application data stretching over a plurality of non-contiguous storage units of the secondary storage apparatus.

The method according to the present invention includes sending to the secondary storage apparatus from the first computer, or a second computer different from the first computer, an object access module that implements an object-based I/O function to reply to object-based I/O requests using the block-based I/O function of the block access module and registering the object access module in the active network storage controller to provide the object-based I/O function with the secondary storage apparatus. Further, the method according to the present invention includes receiving in the secondary storage apparatus from the first computer an object-based I/O request for the application data, and performing the object-based I/O request by executing the object access module.

Thus, according to the present invention as recited in new Claim 36, the secondary storage apparatus has sent thereto a block-based I/O function, from a computer via network, an object access module which is a program module for executing read/write I/O operations to data stored in a plurality of non-contiguous storage units. The object access module is registered in a active network storage controller of the secondary storage apparatus in order to provide object-based I/O function. These features of the present invention are described for example on page 12, lines 11-23; page 18, line 13 - page 19, line 3; page 20, lines 7-16; and page 25, lines 1-3 of the present application. These features of the present invention are not taught or suggested by any of the references of record, particularly Rantala, Tamura and Lin whether taken individually or in combination with each other as suggested by the Examiner.

Further, according to the present invention as recited in new Claim 38, the secondary storage apparatus is sent, from a computer via network, object description data which indicates how the application data is stored on the storage units and the object description data is registered in a active network storage controller of the secondary storage apparatus after sending and registering the object access module as described above with respect to new claim 36. These features of the present invention are not taught or suggested by any of the references of record, particularly Rantala, Tamura and Lin whether taken individually or in combination with each other as suggested by the Examiner.

Still further, according to the present invention as recited in new Claim 42, the secondary storage apparatus is sent, from a computer via network, an advanced

function module that implements an advanced I/O function which is specified according to applications and the advanced function module is registered in a active network storage controller of the secondary storage apparatus under condition that the object access module has already been registered in the active network storage controller. These features of the present invention are described for example on page 20, line 17 - page 21, line 20 etc. of the present application.

Thus, the features of the present invention as described above and as set forth in the above noted passage of the present application are not taught or suggested by any of the references of record, particularly Rantala, Tamura and Lin whether taken individually or in combination with each other as suggested by the Examiner.

Therefore, the features of the present invention as now more clearly recited in the claims are not anticipated nor rendered obvious by Rantala whether taken individually or in combination with one or more of the references of record, particularly Tamura and Lin. Accordingly, reconsideration and withdrawal of the above described rejections is respectfully requested.

To the extent necessary, the applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, or credit any overpayment of fees, to the deposit account of MATTINGLY, STANGER, MALUR & BRUNDIDGE, P.C., Deposit Account No. 50-1417 (520.37728X00).

Respectfully submitted,

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